

SEQUENCE LISTING\*

<110> SIN, Yoke Min  
LAM, Toong Jin  
GONG, Zhiyuan

<120> A RECOMBINANT VACCINE AGAINST FISH INFECTIOUS DISEASES

<130> Applied Research

<140> 09/1996,161

<141> 1998-11-20

<150> 9803188-3

<151> 1998-09-28

<160> 19

<170> PatentIn Ver. 2.1

<210> 1

<211> 105

<212> PRT

<213> Artificial Sequence

<220>

<221> MUTAGEN

<222> (2)

<223> A/S WHERE S HAS BEEN DERIVED FROM THE SYNTHETIC  
GENE.

<220>

<221> MUTAGEN

<222> (4)..(105)

<223> Q - THE GLUTAMINE CODONS TAA AND TAG IN THE  
ORIGINAL SEQUENCE, HAVE BEEN REPLACED WITH THE  
UNIVERSAL GLUTAMINE CODONS CAG OR CAA IN THE  
SYNTHETIC GENE

<220>

<221> MUTAGEN

<222> (34)

<223> V/G WHERE G HAS BEEN DERIVED FROM THE SYNTHETIC  
GENE.

<220>

<221> MUTAGEN

<222> (105)



RECEIVED

SEP 21 2000

TECH CENTER 1600/2900

<223> V/I WHERE I HAS BEEN DERIVED FROM THE SYNTHETIC  
GENE.

<400> 1

Gly Ala Ala Gln Gly Glu Ala Asn Gly Asn Gln Pro Phe Ala Ala Asn  
1 5 10 15

Asn Ala Ala Arg Gly Ile Cys Val Pro Cys Gln Ile Asn Arg Val Gly  
20 25 30

Ser Val Thr Asn Ala Gly Asp Leu Ala Thr Leu Ala Thr Gln Cys Ser  
35 40 45

Thr Gln Cys Pro Thr Gly Thr Ala Leu Asp Asp Gly Val Thr Asp Val  
50 55 60

Phe Asp Arg Ser Ala Ala Gln Cys Val Lys Cys Lys Pro Asn Phe Tyr  
65 70 75 80

Tyr Asn Gly Gly Ser Pro Gln Gly Glu Ala Pro Gly Val Gln Val Phe  
85 90 95

Ala Ala Gly Ala Ala Ala Ala Gly Val  
100 105

<210> 2

<211> 316

<212> DNA

<213> Ichthyophthirius multifiliis

<220>

<221> CDS

<222> (1)..(315)

<400> 2

ggt gct gct taa gga gaa gct aat ggt aat taa cct ttc gca gca aat 48  
Gly Ala Ala Gln Gly Glu Ala Asn Gly Asn Gln Pro Phe Ala Ala Asn  
1 5 10 15

aat gct gct aga ggt ata tgt gta cca tgc caa ata aac aga gta ggc 96  
Asn Ala Ala Arg Gly Ile Cys Val Pro Cys Gln Ile Asn Arg Val Gly  
20 25 30

tct gtt acc aat gca ggt gac tta gct act tta gcc aca taa tgc agt 144  
Ser Val Thr Asn Ala Gly Asp Leu Ala Thr Leu Ala Thr Gln Cys Ser  
35 40 45

act taa tgt cct act ggc act gca ctt gat gat gga gtg aca gat gtt 192  
 Thr Gln Cys Pro Thr Gly Thr Ala Leu Asp Asp Gly Val Thr Asp Val  
 50 55 60

ttt gat aga tca gcc gca taa tgt gtt aaa tgc aaa cct aac ttt tac 240  
 Phe Asp Arg Ser Ala Ala Gln Cys Val Lys Cys Lys Pro Asn Phe Tyr  
 65 70 75 80

tat aat ggt ggt tct cct taa ggt gaa gct cct ggc gtt taa gtt ttt 288  
 Tyr Asn Gly Gly Ser Pro Gln Gly Glu Ala Pro Gly Val Gln Val Phe  
 85 90 95

gct gct ggt gct gcc gct gca ggt gtt g 316  
 Ala Ala Gly Ala Ala Ala Ala Gly Val  
 100 105

<210> 3

<211> 3

<212> PRT

<213> Ichthyophthirius multifiliis

<400> 3

Gly Ala Ala

1

<210> 4

<211> 6

<212> PRT

<213> Ichthyophthirius multifiliis

<400> 4

Gly Glu Ala Asn Gly Asn

1

5

<210> 5

<211> 34

<212> PRT

<213> Ichthyophthirius multifiliis

<400> 5

Pro Phe Ala Ala Asn Asn Ala Ala Arg Gly Ile Cys Val Pro Cys Gln

1

5

10

15

Ile Asn Arg Val Gly Ser Val Thr Asn Ala Gly Asp Leu Ala Thr Leu

20

25

30

Ala Thr

<210> 6  
<211> 3  
<212> PRT  
<213> Ichthyophthirius multifiliis

<400> 6  
Cys Ser Thr  
1

<210> 7  
<211> 20  
<212> PRT  
<213> Ichthyophthirius multifiliis

<400> 7  
Cys Pro Thr Gly Thr Ala Leu Asp Asp Gly Val Thr Asp Val Phe Asp  
1 5 10 15  
Arg Ser Ala Ala  
20

<210> 8  
<211> 15  
<212> PRT  
<213> Ichthyophthirius multifiliis

<400> 8  
Cys Val Lys Cys Lys Pro Asn Phe Tyr Tyr Asn Gly Gly Ser Pro  
1 5 10 15

<210> 9  
<211> 6  
<212> PRT  
<213> Ichthyophthirius multifiliis

<400> 9  
Gly Glu Ala Pro Gly Val  
1 5

<210> 10  
<211> 11  
<212> PRT  
<213> Ichthyophthirius multifiliis

<400> 10

Val Phe Ala Ala Gly Ala Ala Ala Ala Gly Val  
1 5 10

<210> 11

<211> 316

<212> DNA

<213> *Ichthyophthirius multifiliis*

<220>

<221> CDS

<222> (1)..(315)

<400> 11

gga tcc gct cag gga gaa gct aat ggt aat cag cct ttc gca gca aat 48  
Gly Ser Ala Gln Gly Glu Ala Asn Gly Asn Gln Pro Phe Ala Ala Asn  
1 5 10 15

aat gct gct aga ggt ata tgt gta cca tgc caa ata aac aga gta ggc 96  
Asn Ala Ala Arg Gly Ile Cys Val Pro Cys Gln Ile Asn Arg Val Gly  
20 25 30

tct ggt acc aat gca ggt gac tta gct act tta gcc aca caa tgc agt 144  
Ser Gly Thr Asn Ala Gly Asp Leu Ala Thr Leu Ala Thr Gln Cys Ser  
35 40 45

act cag tgt cct act ggc act gca ctt gat gat gga gtg aca gat gtt 192  
Thr Gln Cys Pro Thr Gly Thr Ala Leu Asp Asp Gly Val Thr Asp Val  
50 55 60

ttt gat aga tca gcc gca cag tgt gtt aaa tgc aaa cct aac ttt tac 240  
Phe Asp Arg Ser Ala Ala Gln Cys Val Lys Cys Lys Pro Asn Phe Tyr  
65 70 75 80

tat aat ggt ggt tct cct cag ggt gaa gct cct ggc ctt cag gtt ttt 288  
Tyr Asn Gly Gly Ser Pro Gln Gly Glu Ala Pro Gly Leu Gln Val Phe  
85 90 95

gct gct ggt gct gcc gct gca gga att c 316  
Ala Ala Gly Ala Ala Ala Ala Gly Ile  
100 105

<210> 12

<211> 105

<212> PRT

<213> *Ichthyophthirius multifiliis*

<400> 12

Gly Ser Ala Gln Gly Glu Ala Asn Gly Asn Gln Pro Phe Ala Ala Asn  
1 5 10 15

Asn Ala Ala Arg Gly Ile Cys Val Pro Cys Gln Ile Asn Arg Val Gly  
20 25 30

Ser Gly Thr Asn Ala Gly Asp Leu Ala Thr Leu Ala Thr Gln Cys Ser  
35 40 45

Thr Gln Cys Pro Thr Gly Thr Ala Leu Asp Asp Gly Val Thr Asp Val  
50 55 60

Phe Asp Arg Ser Ala Ala Gln Cys Val Lys Cys Lys Pro Asn Phe Tyr  
65 70 75 80

Tyr Asn Gly Gly Ser Pro Gln Gly Glu Ala Pro Gly Leu Gln Val Phe  
85 90 95

Ala Ala Gly Ala Ala Ala Ala Gly Ile  
100 105

<210> 13

<211> 66

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
oligonucleotides

<400> 13

ggcggatccg ctcagggaga agctaattgt aatcagcctt tcgcagcaaa taatgctgct 60  
agaggt 66

<210> 14

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic

oligonucleotides

<400> 14

accggtacca gagcctactc tgtttatttg gcatgggtaca catatacctc tagcagcatt 60

<210> 15

<211> 66

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
oligonucleotides

<400> 15

accggtacca atgcaggtga cttagctact ttagccacac aatgcagtac tcagtgctcct 60  
actggc 66

<210> 16

<211> 59

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
oligonucleotides

<400> 16

cgtgatctat caaaaacatc tgtcactcca tcatcaagtg cagtgccagt aggacactg 59

<210> 17

<211> 68

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
oligonucleotides

<400> 17

cctgatcagc cgcacagtggt gttaaatgca aacctaactt ttactataat ggtggttctc 60  
ctcagggt 68

<210> 18

<211> 69

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
oligonucleotides

<400> 18

gcgaattcct gcagcggcag caccagcagc aaaaacctga acgccaggag cttcaccctg 60  
aggagaacc 69

<210> 19

<211> 17

<212> DNA

<213> e. coli (XL1-Blue strain, Stratagene)

<400> 19

tagcatggcc ttgcag

17